

10968 Eighth Avenue, Llay, Wrexham

Technical Note 1 Rv0: Nutrient Assessment

18th August 2022

Document Title	Nutrient Assessment	Client	Wales and West Housing Association
Document Ref.	10968 TN01 RV0	Prepared by	S. McGlynn - Brookbanks
Project Name	Eight Avenue, Llay, Wrexham	Checked by	D. Swann - Brookbanks

1 Executive Summary

- 1.1** Brookbanks is appointed by Wales and West Housing Association (WWHA) to complete an initial nutrient assessment for the proposed development at Eighth Avenue, Llay, Wrexham. It is important that any development achieves nutrient neutrality in response to guidance from Natural Resource Wales (NRW) that raises concerns over water quality, particularly the River Dee and Bala Lake Special Area of Conservation (SAC).
- 1.2** Surface water from the site discharges into a tributary of the River Alyn. Foul water from the site is discharged to Gresford STW, with treated effluent entering the River Alyn, which flows into the River Dee downstream. Therefore, this note runs calculations to determine if any additional Total Phosphorus will enter the River Dee and Bala Lake SAC as a result of development proposals. The proposed development includes a change of land use from an existing housing mix to a new housing mix, outlined below:

Current development (30 units)

- 1no. two bedroom house
- 1no. two bedroom flat
- 14no. studios
- 14no. one bedroom flats

Proposed development (25 units)

- 17no. one bedroom flats
- 8no. one bedroom bungalows

- 1.3** Due to the change of housing mix at the site, the maximum number of occupants has reduced, thus lowering the quantity of TP discharged via foul water. The proposals include increasing the urban area within the red line, increasing TP discharged via surface water. This is summarised in **table 1-1** below.

	Current	Future
Wastewater TP generated from the site	2.28	1.81
Surface water TP generated from the site	0.18	0.32
Overall TP Budget (Total)	2.46	2.13
Additional 20% buffer in line with NRW guidance	2.95	2.55

Table 1-1: Overall TP budget for the site

- 1.4** Overall, calculations determine that there is an overall betterment in Total Phosphorus (TP) discharged from the site as a result of the proposed development. This note proves beyond reasonable doubt that **there will be no detriment to the downstream River Dee and Bala Lake SAC as a result of the proposed development.**

2 Development Context

- 2.1 The proposed development exists on a brownfield site comprising of 30 units (1no. two bedroom house, 1no. two bedroom flat, 14no. studios and 14no. one bedroom flats).
- 2.2 The proposed new scheme will total 25 units, including 17no. one bedroom flats and 8no. one bedroom bungalows.
- 2.3 **Figure 2-1** shows the location of the proposed development site (red line), totalling circa 0.47ha.

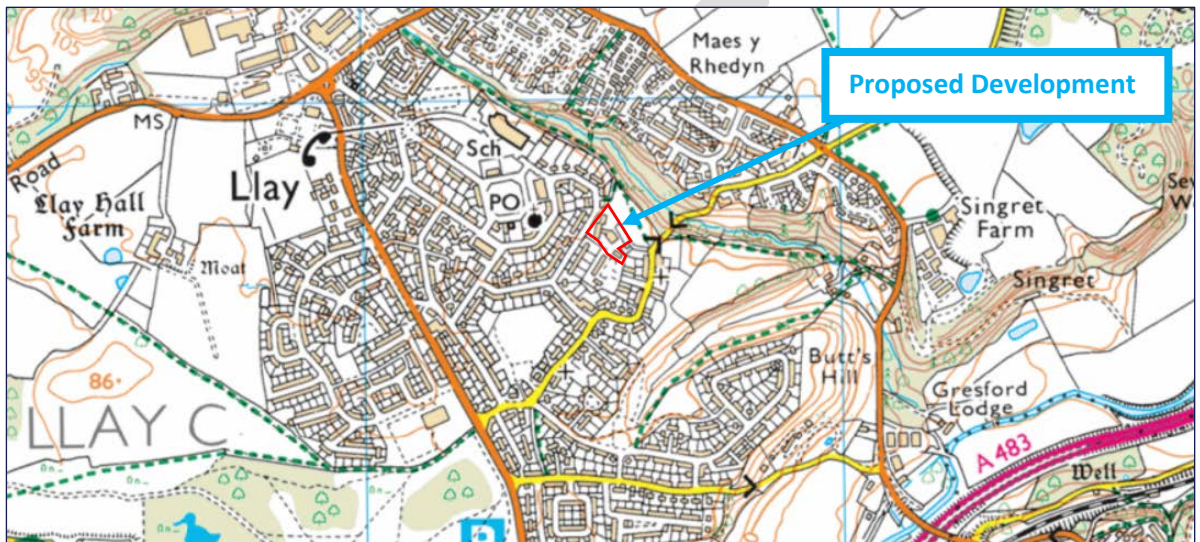


Figure 2-1: Site Location

- 2.4 The site is bound to the east by Eighth Avenue, the north and west by public open space and south by existing residential development.
- 2.5 The existing site plan (drawing 20.211 P-10B) can be seen in **Appendix A**.
- 2.6 The proposed site plan (drawing 20.211 P-105I) can be seen in **Appendix B**.

3 Nutrient Budget Analysis

- 3.1** This section applies the principles behind the four-stage methodology outlined by Natural Reserve Wales to assess the phosphate status at Eighth Avenue, Llay.
- 3.2** As the proposed development consists of a change of land use from urban to urban, with a new mix of housing stock, it is necessary to evaluate the change in anticipated Total Phosphorus (TP) discharged from the site via surface and foul water.

Total Phosphorus Calculations

- 3.3** In order to carry out these calculations, **Table 3-1** sets out the assumptions applied.

Calculation Assumptions				
Current development quantum <i>According to WWHA</i>	1	Two bedroom house	4	Maximum occupancy
	1	Two bedroom flat	3	Maximum occupancy
	14	Studios	2	Maximum occupancy
	17	One bedroom flat	2	Maximum occupancy
Current development areas <i>Assumed from site layout plan</i>	0.17	Ha – Urban Area		
	0.30	Ha – Open Space		
Proposed development quantum <i>According to WWHA</i>	17	One bedroom flat	2	Maximum occupancy
	8	One bedroom bungalow	2	Maximum occupancy
Proposed development areas <i>Assumed from site layout plan</i>	0.37	Ha – Urban Area		
	0.10	Ha – Open Space		
Water consumption	110	Litres/person/day		
Wastewater treatment works	Gresford Sewage Treatment Works [STW] (confirmed by Welsh Water)			
Phosphorus consent limit at STW	1	mg/l taken from The Dee Catchment Phosphorus Reduction Strategy		
Soil Type	Freely draining slightly acid loamy soils			

Table 3-1: Development Assumptions

- 3.4** Based on the assumptions set out above in **Table 3-1** and following a similar methodology to that proposed by Natural Resource Wales, **Table 3-2** sets out the TP budget for the development site as it currently exists and under the development proposals.

	Current	Future	Explanation
Wastewater TP	2.28	1.81	Change in foul water discharge from the site due to alteration of housing mix and associated maximum occupancy levels
Surface water TP	0.18	0.32	Change in surface water discharge from the site due to alteration of area of external hard surfacing, categorised as urban area, with the remainder of the site categorised as open space
TP Budget	2.46	2.13	Wastewater TP + Surface water TP
Additional 20% buffer	2.95	2.55	As per NRW guidance where TP budget is positive

Table 3-2: Change in Total Phosphorus Budget due to change in housing mix at the proposed site

- 3.5** **Table 3-2** shows that the change in housing stock and associated maximum occupancy levels at the proposed development site result in a betterment to Total Phosphorus discharge at the site.
- 3.6** A lower maximum population under the development proposals results in less TP generated from foul water discharge. Although these proposals result in a slightly higher area 'urban area', generating higher levels of TP than previously via surface water, this is offset by the larger TP betterment delivered through lowering TP discharged via foul water.
- 3.7** Overall, it is demonstrated that the proposals for the development site will result in an overall betterment of TP discharged from the site. Therefore, it is proven beyond reasonable doubt that the proposed development will not have an adverse impact on the downstream River Dee and Bala Lake SAC.

Further considerations

- 3.8** This note assumes a water consumption of 110 litres per person per day based on Building Regulations optional requirement. It is likely that the existing development consumes water at a higher rate than this, therefore these calculations are considered conservative by assuming a consistent water consumption rate.

4 Summary

- 4.1** This technical note carries out an initial nutrient assessment on the proposed development at Eighth Avenue, Llay, Wrexham.
- 4.2** Surface water from the site discharge into a tributary of the River Alyn. Foul water from the site is discharged to Gresford STW, which discharged its' treated effluent into the River Alyn, which flows into the River Dee downstream. Therefore, this note runs calculations to determine if any additional Total Phosphorus will enter the River Dee and Bala Lake SAC as a result of the development proposals.
- 4.3** Due to the change of housing mix at the site, the maximum number of occupants has reduced, thus lowering the quantity of TP discharged from the proposed development via foul water. As the proposals include increasing the urban area within the red line, there is a small increase in TP discharged from the site via surface water.

- 4.4 However, overall there is a betterment of TP entering the downstream River Dee and Bala Lake SAC as a result of the proposed development. This note therefore proves beyond reasonable doubt that the development will not have an adverse impact on the downstream Habitats Site.

Limitations

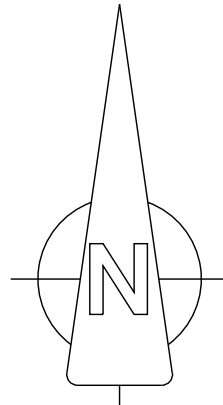
- 4.5 The conclusions and recommendations contained herein are limited to those given the general availability of background information and the planned usage of the site.
- 4.6 Third party information has been used in the preparation of this report, which Brookbanks, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks accepts no liability for same.
- 4.7 The benefits of this report are provided solely to Wales and West Housing Association for the proposed development at Eighth Avenue, Llay.
- 4.8 Brookbanks excludes third party rights for the information contained in the report.

Appendix A – Current Site Layout

DRAFT



NOTES:
ALL DIMENSIONS TO BE CHECKED AND CONFIRMED ON SITE PRIOR TO ANY WORKS OR FABRICATION.
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B	10.03.22	Site boundary amended	PO
A	08.03.22	Site boundary amended	PO
REV	DATE	DESCRIPTION	BY

Drawing Status
PLANNING



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Wales and West Housing

Project
Cwrt Pentwmpath
Eighth Avenue
Llay
Wrexham
LL12 0TT

Scale 1:250 @ A1 1:500 @ A3	Date November 2021 Drawn PCO
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Drawing Title
EXISTING SITE PLAN

Project No. 20.211	Drawing No. P-10	Revision B
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Appendix B – Proposed Site Layout

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DO NOT SCALE OFF THIS DRAWING.
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1.8m high timber hit and miss fencing with concrete posts and gravel boards

1.8m high personnel gate to match fencing Lockable to SBD standard.

Concrete paving slabs to private paving. Paths to be 900mm wide (minimum) or 1200mm wide (minimum) to shared or communal areas.

6'X4' shed securely fixed to concrete base.

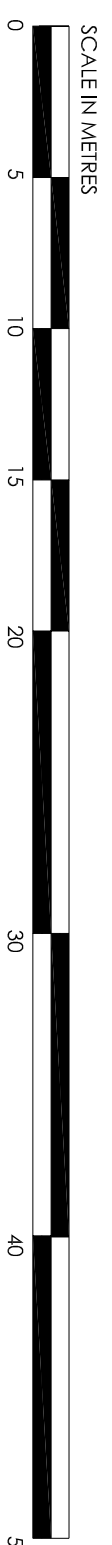
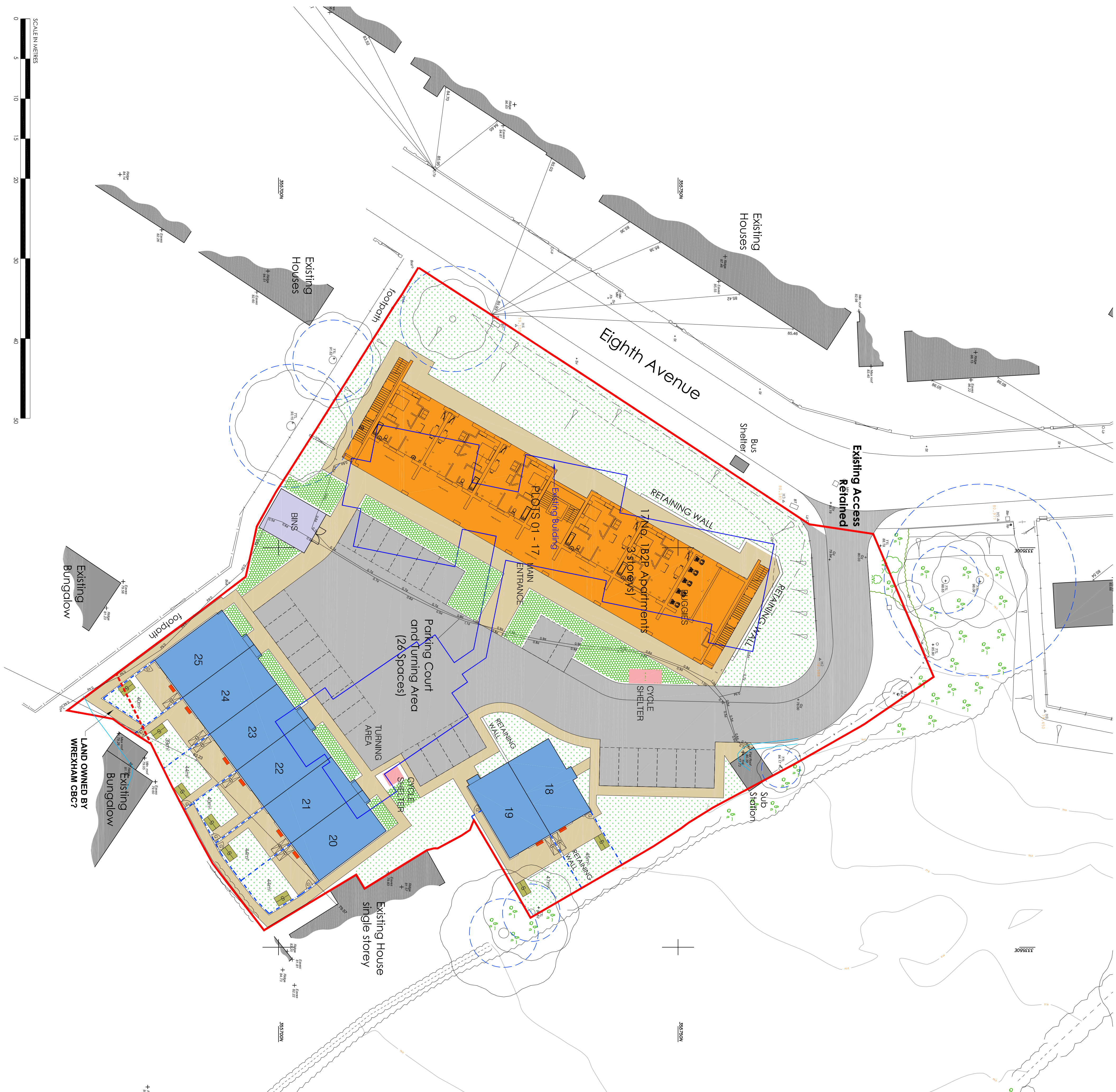
 B Aled identified for storage of refuse and recycling bins and trolley.

 Air source heat pump unit.

Soft landscaping

Schedule of Accommodation	
8	1B2P bungalows
17	1B2P apartments
25	total

Site Area 4731m² approx



REV	DATE	DESCRIPTION	BY
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PRELIMINARY



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Wales and West Housing

Eighth Avenue

Lily

11120TT
WICKLIFF

1:250 @ A1	November 2021
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PCO

Site Layout

Project No.	Drawing No.	Revision
20.211	P-105	I

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